



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/767,182

01/29/2004

Pazhani Pillai

SUN03-03(P9403)

4649

51344

7590

06/07/2011

BROOKS KUSHMAN P.C. /Oracle America/ SUN / STK
1000 TOWN CENTER, TWENTY-SECOND FLOOR
SOUTHFIELD, MI 48075-1238

EXAMINER

HOANG, HIEU T

ART UNIT

PAPER NUMBER

2452

MAIL DATE

DELIVERY MODE

06/07/2011

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/767,182	Applicant(s) PILLAI ET AL.	
	Examiner HIEU HOANG	Art Unit 2452	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 March 2011.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 28-43 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 28-43 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Art Unit: 2452

DETAILED ACTION

1. This office action is in response to the communication filed on 03/22/2011.
2. Claims 1-27 are cancelled.
3. Claims 28-43 are new and pending.

Claim Rejections - 35 USC § 101

4. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

5. Claims 36-43 are rejected under 35 USC 101 because the claimed invention is directed to nonstatutory subject matter. The “communication interface” claim is not a process, a machine, manufacture, or composition of matter. The claimed elements “processor”, “port”, “interconnection mechanism” are non-structural limitations, and given broadest reasonable interpretation, can be read as software modules per se. (see IEEE100 - The Authoritative Dictionary of IEEE Standards Terms, 7th ed. for definitions of the terms). Therefore, the claimed subject matter as a whole fails to fall within the definition of a process, a machine, manufacture, or composition of matter. Applicant is suggested to add any physical hardware element to the claims (for example, a memory) to overcome the rejection.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. **Claims 28-34, 36-42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Saha et al. (US 2004/0117375, hereafter Saha), in view of Zuberi (US 2003/0204552).**

8. For claim 28, Saha discloses a method for performing remote access commands between nodes, the method comprising:

establishing a mutually pre-agreed upon data allotment for a first node and a second node ([0054], fig. 5, *memory allocation 516 and 526, each of a client and a server allocates a portion of its memory for the other*);

detecting an application request in a request queue ([0063], *the transferor has a transfer queue for queuing data transfer to the recipient*), the application request identifying a data access task to be performed between the first and second node ([0030], *Write task including Insert, [0037], Read task including Update or Select*);

assigning a context including a set of channel adapter resources (fig. 5, *assigning client/server four memory buffers*) of the first node to process the application request to completion of the data access task, the context operating a task manager

Art Unit: 2452

that tracks an offset for the data access task ([0059], lines 9-19, [0060], lines 14-22, *mechanism for queuing data in asynchronous transfer and tracking which data to be transferred next upon a completion of data transfer in a buffer*);

issuing a first request from the first node to the second node, the first request requesting the data access task be performed between the first node and the second node ([0060], fig. 5, [0056], [0059], *first data and ACK pair indicates client request to write data to server's database, e.g., from buffer 515 to buffer 525*);

receiving, at the first node, a first response from the second node that partially completes the data access task and that contains data in an amount not exceeding the data allotment (fig. 5, [0059], lines 7-9, *first ACK indicates data in buffer 525 has been used by the server; buffer space not exceeding the memory allotment*);

issuing at least one subsidiary request from the first node to the second node to further complete the data access task between the first node and the second node, the at least one subsidiary request based on an amount of partial completion of the data access task between the first node and the second node ([0059], lines 9-19, [0060], lines 14-22, *further data transfer is possible upon completion of a previous data transfer in a buffer*); and

receiving, from the second node in response to the at least one subsidiary request, at least one corresponding subsidiary response that further completes the data access task between the first node and the second node and that contains data in an amount not exceeding the data allotment ([0059], lines 9-19, [0060], lines 14-22, *further*

Art Unit: 2452

data transfer request is possible upon completion of a previous data transfer in a buffer, buffer space not exceeding the memory allotment);

wherein a new starting value for each subsidiary request is calculated from the offset ([0058], *offsetting or determining the next data chunk to be transferred*); wherein the context is pre-emptible between the first response and a first subsidiary request, and between a subsidiary response and a subsequent subsidiary request ([0059], lines 9-19, [0060], lines 14-22, *buffer is emptied between upon completion of a buffer transfer so that subsequent transfers can be done*).

Saha does not disclose the context pre-emptible between the first response and a first subsidiary request, and between a subsidiary response and a subsequent subsidiary request to support other access tasks by the channel adapter performing a context switch.

Zuberi discloses in an event of a context switch, context resources for a task is pre-empted for processing other tasks ([0004], [0007], [0030], [0033], fig. 4, resources can be preempted to support two RDMA tasks)

It would have been obvious to one skilled in the art at the time of the invention to combine the teachings of Saha and Zuberi's context switch. The motivation would be to make resources available to support different tasks with different priorities.

9. For claim 29, Saha-Zuberi further discloses pre-empting the context prior to full completion of the data access task; issuing a second request from the first node for an

Art Unit: 2452

other data access task; and resuming the context (Zuberi, [0004], [0007], [0030], [0033], fig. 4).

10. For claim 30, Saha-Zuberi further discloses the other data access task is identified by a different application request in a different request queue (Zuberi, [0004], [0007], [0030], [0033], fig. 4).

11. For claim 31, Saha further discloses issuing at least one subsidiary request comprises: calculating a remaining amount of data required to complete the data access task between the first node and the second node; and creating a least one subsidiary request to reference at least a portion of the remaining amount of data required to complete the data access task (Saha, [0057], [0058], Zuberi, [0004], [0007], [0030], [0033], fig. 4).

12. For claim 32, Saha further discloses calculating the remaining amount of data comprises: determining a total completed amount of data processed for the data access task by the first request and associated first response and all subsidiary requests and corresponding subsidiary responses between the first and second node; and determining the remaining amount of data required to complete the data access task as a difference between an initial amount of data specified by an application request and the total completed amount of data (Saha, [0057], [0058], Zuberi, [0004], [0007], [0030], [0033], fig. 4).

13. For claim 33, Saha further discloses the first and second nodes are nodes that utilize channel adapters to exchange the first request and the at least one subsidiary request and the corresponding first response and the at least one subsidiary response; the application request is a remote direct memory access request for the first node to access data in a memory at the second node; and an initial amount of data specified by the application request is a total amount of data that the first node is to access in the memory at the second node (Saha, [0057], [0058], Zuberi, [0004], [0007], [0030], [0033], fig. 4).

14. For claim 34, Saha further discloses the first request and the at least one subsidiary request are read remote direct memory access commands issued by the first node to read data in the memory from the second node (Saha, [0037]).

15. Claims 36-42 are rejected for the same rationale as in claims 28-34 respectively.

16. Claims 35 and 43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Saha-Zuberi, further in view of Turner et al. (An Approach For Congestion Control in Infiniband, hereafter Turner).

17. For claim 35, Saha-Zuberi discloses the invention as in claim 11. Saha-Zuberi does not disclose dynamically determining the data allotment between the first and

Art Unit: 2452

second nodes based on at least one external data allotment event, such that if the at least one external data allotment event occurs, the first and second nodes change a value of the data allotment.

However, Turner discloses dynamically determining the data allotment between the first and second nodes based on at least one external data allotment event, such that if the at least one external data allotment event occurs, the first and second nodes change a value of the data allotment (fig. 2, section 5.1.3.2, changing a receive window based on a condition)

Therefore, it would have been obvious for one skilled in the art at the time of the invention to combine the teachings of Saha-Zuberi and Turner to adjust the amount of maximum data allotment (window control) to, e.g., avoid network congestion (Turner, abstract).

18. Claim 43 is rejected for the same rationale given in claim 35.

Conclusion

19. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hieu T. Hoang whose telephone number is 571-270-1253. The examiner can normally be reached on Monday-Thursday, 8 a.m.-5 p.m., EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thu Nguyen can be reached on 571-272-6967. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2452

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/HIEU HOANG/
Primary Examiner, Art Unit 2452